

Remarks

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/19/2008 has been entered.
2. This office action is in response to the amendment filed on 03/19/2008.
3. Claims 1, 11, 16 and 19 have been amended.
4. Claims 1-24 remain pending and have been examined.

Response to Arguments

5. Applicant's amendment to independent claims 1, 11 and 19 changes the scope of all claims and thus a new ground of rejection is applied. Applicant's arguments with respect to claims 1, 11 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (Rao et al., US 7,082,549 B2) in view of Yang (US 2004/0040020 A1)

Claim 1:

Rao discloses a mobile handset (see for example, Fig.1, item 143, "Mobile Handset" and related text) comprising:

- at least one of a firmware component and a soft-ware component (see for example, Fig.1, item 117 "Update Agent", item 115 "Bootstrap" and related text);
- an update agent capable of updating the at least one of a firmware component and a software component employing an update process that comprises a plurality of transform passes (see for example, Fig.2, step 207-223 and related text); and
- the update agent executing at least one of the plurality of transform passes (update steps) in a fault-tolerant mode (see for example, Fig.1, "Bank 1...N", Fig.3 about updating process; also see Fig.2, step 215 "Fault-tolerant Update" and related text).

but does not explicitly disclose each transform pass is associated with its own memory bank order. However, Yong in the same analogous art of firmware/software updates in mobile hand set in fault-tolerant mode discloses updating an electronic device from a first code version to a second code version according to a bank order (see for example, paragraph 0006]-[0008]; also see Fig.2, each transform pass (content in memory bank) keeps its own memory

bank order after transforming/shifting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to associate each transform pass with its own memory bank order. One would have been motivated to do so to update software/firmware in the bank order to reduce the amount of copying of the contents (transform pass) of the memory being updated, reducing the time needed to update the memory, and extending the life of the memory devices as suggested by Yong (see for example, p.5, paragraph [0035])

Claim 2:

Rao further discloses the mobile handset according to claim 1 wherein the update agent executes each of the plurality of transform passes in a fault-tolerant mode (see for example, Fig.3, steps 307-323, "Working Bank", "Backup Bank" and related text).

Claim 3:

Rao also discloses the mobile handset according to claim 1 wherein the update process comprises a pre-processing pass (see for example, Fig.3, step 311, "Copy Original Bank to Working Bank" and related text) and an update pass (see for example, Fig.3, step 313, "Update Working Bank" and related text).

Claim 4:

Rao further discloses the mobile handset according to claim 1 wherein the update agent is capable of determining a point of interruption of the update process, so as to restart the update process from the point of interruption on a subsequent invocation of the update process (see for example, Fig.1, step 213 "Determine Where to resume" and related text; also see Fig.5, step 509, "Determine Starting/Resumption Point" and related text).

Claim 5:

Rao also discloses the mobile handset according to claim 4 wherein the update agent is capable of efficiently determining whether a previous invocation of the update process was interrupted during a pre-processing pass or during an update pass (see for example, Fig.1, step 213 "Determine Where to resume" and related text; also see Fig.5, step 509, "Determine Starting/Resumption Point" and related text; further see col.8, lines 51-54, "the point at which update processing should begin or resume may be determined using a verification process in which a CRC value is computed for each bank of non-volatile memory being updated.").

Claim 6:

Rao further discloses the mobile handset according to claim 1 wherein the update agent is capable of efficiently determining which of the plurality of transform passes was interrupted during a previous execution of the update

process (see for example, col.8, lines 51-54, "the point at which update processing should begin or resume may be determined using a verification process in which a CRC value is computed for each bank of non-volatile memory being updated.").

Claim 7:

Rao also discloses the mobile handset according to claim 1 wherein the mobile handset further comprises:

- a plurality of memory banks (see for example, Fig.1, "Bank 1...N" and related text);
- a set of special signatures comprising at least one special signature corresponding to each of the plurality of transform passes; the at least one special signature being associated with the last of the memory banks that is updated in the corresponding transform pass (see for example, col.8, lines 51-54, "the point at which update processing should begin or resume may be determined using a verification process in which a CRC value is computed for each bank of non-volatile memory being updated.");
- at least a subset of the plurality of memory banks being modified in each of the plurality of transform passes (see for example, Fig.3, steps 307-323 and related text); and
- the update agent capable of determining which of the plurality of transform passes was interrupted during a previous execution of the update process

(see for example, Fig.5, step 509, "Determine Starting /Resumption Point" and related text).

Claim 8:

Rao further discloses the mobile handset according to claim 7 wherein the update agent determines the transform pass that was interrupted during a previous execution of an update process, and the specific one of the plurality of memory banks that was last to be successfully updated, in order to resume the update process (see for example, col.8, lines 54-62, "The comparison continues in a bank-by-bank fashion through the list until a bank of non-volatile memory is encountered where the computed CRC value files to match the value in the list for that bank. The failed match indicated an anomaly or corruption, thus indicating the point at which the update activity should start or resume").

Claim 9:

Rao further discloses the mobile handset according to claim 8 wherein the update agent compares, in a transform pass order, each special signature from the set of special signatures to a signature computed for the last bank to be updated in the corresponding transform pass, until a mismatch is detected, the mismatch indicating a point of interruption during a previous update attempt (see for example, col.8, lines 54-62, "The comparison continues in a bank-by-bank fashion through the list until a bank of non-volatile memory is encountered where

the computed CRC value files to match the value in the list for that bank. The failed match indicated an anomaly or corruption, thus indicating the point at which the update activity should start or resume").

Claim 10:

Rao also discloses the mobile handset of claim 7 wherein the special signature comprises one of a cyclic redundancy check (CRC) value and an MD5 hash value (see for example, col.8, lines 51-53, "update processing should begin or resume may be determined using a verification process in which a CRC value is computed; also see col.10, lines 51-53, "a CRC value (or a MD5 checksum, etc) is computed to verify the results of the update operations on that bank").

Claim 11:

Rao discloses a mobile handset comprising a plurality of memory banks containing at least one of a firmware and a plurality of software components, the mobile handset comprising (see for example, Fig.1 "Bank 1...N", item 111 "Non-Volatile Memory with Firmware/Software" and related text):

- an update package comprising a difference information (see for example, col.6, lines 10-27, the update package contains "update instructions" and "predetermined value for the bank being updated");
- an update agent capable of updating at least a portion of the at least one of firmware and a plurality of software components, the update agent employing

an update process that comprises a plurality of transform passes, each transform pass updating a subset of the plurality of memory banks in a predetermined bank order for that transform pass (see for example, Fig.1, item 117, "Update Agent" and related text); and

- a set of decision maker banks identified within the plurality of memory banks, one decision maker bank for each of the plurality of transform passes, the set of decision maker banks used to determine which of the plurality of transform passes was interrupted, in order that the update process may be subsequently reattempted beginning with the interrupted transform pass (see for example, col.8, lines 41-62, "The comparison continues in a bank-by-bank fashion through the list until a bank of non-volatile memory is encountered where the computed CRC value fails to match the value in the list for that bank."; also see col.6, lined 61-col.6, line 9 about "bank order specification").

but does not explicitly disclose each transform pass is associated with its own memory bank order. However, Yong in the same analogous art of firmware/software updates in mobile hand set in fault-tolerant mode discloses updating an electronic device from a first code version to a second code version according to a bank order (see for example, paragraph 0006]-[0008]; also see Fig.2, each transform pass (content in memory bank) keeps its own memory bank order after transforming/shifting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to associate each transform pass with its own memory bank order. One would

have been motivated to do so to update software/firmware in the bank order to reduce the amount of copying of the contents (transform pass) of the memory being updated, reducing the time needed to update the memory, and extending the life of the memory devices as suggested by Yong (see for example, p.5, paragraph [0035])

Claim 12:

Rao further discloses the mobile handset of claim 11 wherein the update package comprises information identifying the set of decision maker banks (see for example, col.6, lines 10-27, the update package contains "update instructions" and "predetermined value for the bank being updated"; also col.8, lines 54-56, "The computed value for each bank is then compared to the corresponding pre-computed value in a list of the firmware/software").

Claim 13:

Rao also discloses the mobile handset of claim 11 wherein the difference information comprises a set of executable instructions for converting a first version of the at least a portion of the at least one of firmware and a plurality of software components, to a second version of the at least a portion of the at least one of firmware and a plurality of software components (see for example, Fig.6, steps 607-623 and related text).

Claim 14:

Rao further discloses the mobile handset of claim 11 wherein the update agent is capable of:

- i) computing a signature for a decision maker bank in the set of decision maker banks, beginning with the decision maker bank for the first transform pass in the transform pass order (see for example, col.8, lines 41-62, "CRC value is computed" and related text);
- ii) comparing the computed signature to a corresponding predetermined signature for that transform pass, the predetermined signature contained in the update package, to determine whether a match exists (see for example, col.8, lines 41-62, "compared to the corresponding pre-computed value" and related text) ;
- iii) repeating (i) and (ii) for the next transform pass in the transform pass order, if a match exists (see for example, col.8, lines 41-62, "The comparison continues in a bank by bank fashion through the list until..."); and
- iv) identifying the current transform pass as a point of interruption, if a match does not exist (see for example, col.8, lines 41-62, "The failed match indicates an anomaly or corruption, thus indicating the point at which the update activity should start or resume.").

Claim 15:

Rao also discloses the mobile handset of claim 14 wherein:

the update package comprises a predetermined checksum for each memory bank in the subset of the plurality of memory banks for the interrupted transform pass (see for example, col.8, lines 41-62, "corresponding pre-computed value in a list of CRC values provided within the update package.")

Claim 16:

Rao further discloses the mobile handset of claim 14 wherein the update agent is capable of:

- initiating a recovery from the point of interruption in the transform pass order; and (see for example, Fig.6, step 609, "Determine Starting/Resumption Point" and related text)
- determining the first bank in the associated memory bank order for the interrupted transform pass for which a mismatch between a computed checksum and a predetermined checksum for a memory bank in the associated memory bank order for the interrupt transform pass occurs (see for example, Fig.6, steps 611-613 and related text).

Claim 17:

Rao further discloses the mobile handset of claim 16 wherein the computed checksum and the predetermined checksum comprise a cyclic redundancy check (CRC) value (see for example, col.8, lines 51-53, "update processing should

begin or resume may be determined using a verification process in which a CRC value is computed”).

Claim 18:

Rao also discloses the mobile handset of claim 16 wherein the computed checksum and the predetermined checksum comprise a MD5 hash value (see for example, col.10, lines 51-53, “a CRC value (or a MD5 checksum, etc) is computed to verify the results of the update operations on that bank”).

Claim 19:

Rao discloses a method for recovering from interruption of a fault-tolerant process of updating a mobile handset comprising a plurality of memory banks from a first firmware version to a second firmware version, the update process comprising a plurality of transform passes and having a transform pass order, each of the plurality of transform passes performing a transform upon the plurality of memory banks in a memory bank order, the method comprising:

- determining as a recovery transform pass, one of the plurality of transform passes interrupted during the update process (see for example, Fig.6, step 609, “Determine Starting /Resumption Point” and related text);
- determining as a recovery memory bank, one of the plurality of memory banks in the memory bank order for the interrupted transform pass during

which update processing was interrupted (see for example, Fig.6, step 611, “Copy Original Bank to Working Bank” and related text); and

- invoking the update process by performing an update of the recovery memory bank using the recovery transform pass (see for example, Fig.6, step 613, “Update Working Bank using Backup Bank” and related text).

but does not explicitly disclose each transform pass is associated with its own memory bank order. However, Yong in the same analogous art of firmware/software updates in mobile hand set in fault-tolerant mode discloses updating an electronic device from a first code version to a second code version according to a bank order (see for example, paragraph 0006]-[0008]; also see Fig.2, each transform pass (content in memory bank) keeps its own memory bank order after transforming/shifting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to associate each transform pass with its own memory bank order. One would have been motivated to do so to update software/firmware in the bank order to reduce the amount of copying of the contents (transform pass) of the memory being updated, reducing the time needed to update the memory, and extending the life of the memory devices as suggested by Yong (see for example, p.5, paragraph [0035])

Claim 20:

Rao further discloses the method according to claim 19 wherein determining a recovery transform comprises:

- employing one of the plurality of memory banks as a decision maker bank for each of the plurality of transform passes, each of the decision maker banks identifying the last bank of the memory bank order for the corresponding one of the plurality of transform passes to be updated, the decision maker banks retrievable from an update package (see for example, col.8, lines 41-62, "The comparison continues in a bank by bank fashion through the list until..."); and
- determining an interrupted transform pass in the transform pass order, based upon the decision maker banks for the plurality of transform passes in the fault-tolerant update process (see for example, col.8, lines 41-62, "The comparison continues in a bank-by-bank fashion through the list until a bank of non-volatile memory is encountered where the computed CRC value fails to match the value in the list for that bank. The failed match indicates an anomaly or corruption, thus indicating the point at which the update activity should start or resume.").

Claim 21:

Rao further discloses the method according to claim 20 wherein determining an interrupted transform pass comprises:

- i) computing a checksum of a decision maker bank, beginning with the first transform pass in transform pass order (see for example, col.8, lines 41-62,

"CRC value is computed" and related text);

ii) comparing the computed checksum to a predetermined checksum retrieved from the update package to determine whether the computed checksum matches the predetermined checksum exists (see for example, col.8, lines 41-62,

"compared to the corresponding pre-computed value" and related text);

iii) repeating (i) and (ii) for the decision maker bank of each of the subsequent transform passes in the transform pass order, if the computed and the predetermined checksums for a decision maker bank match (see for example, col.8, lines 41-62, "The comparison continues in a bank by bank fashion through the list until..."); and

iv) Identifying as interrupted, a transform pass for which the computed and predetermined checksums for a decision maker bank do not match (see for example, col.8, lines 41-62, "The failed match indicates an anomaly or corruption, thus indicating the point at which the update activity should start or resume.").

Claim 22:

Rao also discloses the method according to claim 21 wherein the computed checksum comprises one of a cyclic redundancy check (CRC) value and an MD5 hash value (see for example, col.8, lines 51-53, "update processing should begin or resume may be determined using a verification process in which a CRC value

is computed; also see col.10, lines 51-53, "a CRC value (or a MD5 checksum, etc) is computed to verify the results of the update operations on that bank").

Claim 23:

Rao further discloses the method according to claim 20 wherein the update package comprises a set of executable instructions for converting a first firmware version to a second firmware version (see for example, Fig.6, steps 611-613 and related text).

Claim 24:

Rao further discloses the method according to claim 19 wherein the method is employed during both an initial update attempt and during recovery from an interrupted update attempt (see for example, Fig.6, step 609, "Determine Starting/Resumption Point" and related text).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zheng Wei whose telephone number is (571) 270-1059 and Fax number is (571) 270-2059. The examiner can normally be reached on Monday-Thursday 8:00-15:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571- 272-1000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Z. W./

Examiner, Art Unit 2192

/Tuan Q. Dam/

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